

STAR MAPPER

Perkin-Elmer Corporation, Norwalk, Connecticut, prime contractor for the Optical Telescope Assembly of NASA's Space Telescope (see page 35), is conducting research on advanced space astronomy systems that will be operating in the 1990s and beyond. A major requirement of such systems is an exquisitely accurate method of pointing—aiming the spacecraft's telescope, camera and other instruments. The instruments may have to point for a long time at a single star, while in other instances they may have to change pointing angles in a smooth, continuous sweep to scan a large region of the heavens. For precision pointing and estimation of the spacecraft's attitude, Perkin-Elmer's Optical Technology Division, Danbury, Connecticut is developing new types of sensors, such as the star mapper pictured.

Because earlier star mappers using photoelectron tube detectors cannot easily meet the stringent pointing requirements for the advanced astronomical

spacecraft NASA is contemplating, Perkin-Elmer is concentrating its development efforts on "charged coupled device" detectors, or CCDs. CCDs are microelectronic silicon "chips" that sense starlight and convert it to electrical signals, which are processed to determine the attitude of the spacecraft. Attitude determination provides accurate measurement of pointing angles.

In computerized simulations of star sensor performance, Optical Technology Division engineers use a computer program supplied by NASA's Computer Software Management and Information Center (COSMIC). Known as Skymap Star Catalog and Data Base, the program provides an accurate star map of any part of the sky. Skymap data is used to determine the number of stars that can be detected by the CCD sensors, information necessary to the design of an optical system of proper size and field of view. Perkin-Elmer reports that the Skymap software has allowed them to confirm the design integrity of their star sensors, which provide extraordinary accuracies and represent a major advance in optical technology.

